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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,748	07/09/2003	Gary A. Brist	42P12136D	2763

7590 05/08/2006

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EXAMINER

ANYA, IGWE U

ART UNIT PAPER NUMBER

2891

DATE MAILED: 05/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/616,748

Applicant(s)

BRIST ET AL.

Examiner

Igwe U. Anya

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-21 and 23-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27-32 is/are allowed.
- 6) ☒ Claim(s) 17-21 and 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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- | | |
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| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
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| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The Declaration filed on February 7, 2006 under 37 CFR 1.131 is sufficient to overcome the Marathe et al. reference.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 17 – 20, 23, 24 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Doan (US Patent 6124205).
4. Doan teaches an apparatus(figs. 3 – 6), comprising:
 - an electrically conductive trace (50) on a substrate, the electrically conductive trace including first material (40) disposed on a second materials (38), wherein a portion of the first material is diffused into a portion of the second material (col. 7 lines 13 – 24);
 - an inter-layer dielectric material (72, 78) electrically isolating the electrically conductive trace (col. 7 lines 24 – 36);
 - wherein the substrate is part of one of a semiconductor package, a printed circuit board, or a die (col. 3 lines 52 – 59);

wherein the second material includes metal (col. 4 lines 18 – 22);
wherein the electrically conductive trace includes a copper tin alloy (col. 6 lines 14 – 17, & col. 6 line 66 – col. 7 line 3);
wherein the second material includes copper (col. 6 line 66 – col. 7 line 3);
wherein the first material includes tin (col. 6 lines 14 – 17); and
wherein the first material includes a conversion coating material (col. 6 lines 14 – 17).

5. According to the product-by-process doctrine, process language in a product claim must structurally distinguish the invention over the prior art in order to be afforded a patentable weight. As such the limitation of using a laser for diffusion has not been given any patentable weight.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doan (US Patent 6124205).

9. Doan teaches the features previously outlined, but lack wherein the electrically conductive trace is between about 10 microns and about 20 microns in thickness and between about 27 microns and about 35 microns in width.

10. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture a conductive trace of any width or thickness.

Where the general conditions of a claim are disclosed in prior art, discovering the optimum or working ranges involves only routine skill in the art.

11. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doan (US Patent 6124205) in view of D'Amato (US Patent 4895099).

12. Doan teaches the features previously outlined, but lack wherein the first material includes an organic material.

13. However, D'Amato teaches diffusing an organic tin material disposed on a copper material by thermal treatment to form bronze alloy conductive trace having enhanced bonding (col. 1 line 41 – col. 2 line 29).

14. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of D'Amato into the Doan method for enhanced bonding.

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15. Claims 27 – 32 are allowable, because prior does not teach a polymer epoxy as a first material diffused into a second material to form an alloy of the first and second material.

Contact Information

16. Any inquiry concerning this communication or earlier communications from the examiner, should be directed to Igwe U. Anya whose telephone number is (571) 272-1887. The examiner can normally be reached on M - F 8:30am - 5:00pm.

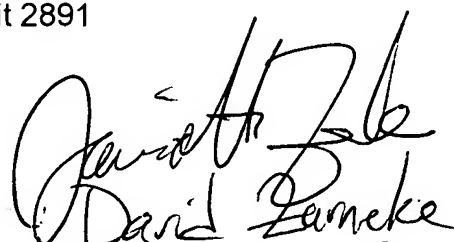
17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Igwe U. Anya
Examiner
Art Unit 2891

IA

April 26, 2006


David Zamecke
Primary Examiner
5/4/06